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Boeing's Dreamliner: Takeoff Delays?

Thought
Leadership



On October 10, 2007, the Boeing Company (Boeing) announced a six month delay in its initially planned deliveries of 787 Dreamliners. Deliveries of the strong-selling Dreamliner were now slated to begin in late November or December 2008, versus an original target of May 2008. The announcement made investors wary, as Boeing has in-hand orders for 762 Dreamliner from 52 customers. But the management remains confident and still aims to deliver 109 jets in 24 months. That doesn't pacify the concerns of investors and customers amidst – engineering changes, struggling suppliers, weight reduction, aircraft certification and a challenging target of getting on production from zero to six airplanes a month by 2009.

Boeing's Dreamliner

The Dreamliner is Boeing's first all-new plane since 1995, a super-efficient airplane with new passenger-pleasing features. The 787 Dreamliner will be the world's first large commercial jetliner with an airframe made of carbon fiber composite rather than aluminum. With a seating capacity of 200 – 300 and a speed of Mach 0.85, it promises the economics of large jet transports to the middle of the market, using 20% less fuel than any other airplane of its size. The company has estimated the market size at 3,500 units over 20 years (2004-2023) and \$400 billion in revenues.

In its effort to lower the \$10 billion cost of developing the 787, Boeing is following an aggressive production schedule. For decades, Boeing has outsourced a portion of the work on its planes, and its reliance on sub-contractors has risen with each succeeding generation of aircraft. 70% of the 787 has been outsourced and the Dreamliner's final-assembly process had been designed to bring together about 1,200 components. Boeing manufactures the 787's tail fin at its plant in Frederickson, Washington, the ailerons and flaps at Boeing Australia, and fairings at Boeing Canada Technology. For economic reasons, the wings are manufactured by Japanese companies in Nagoya, e.g. Mitsubishi Heavy Industries; the horizontal stabilizers are manufactured by Alenia Aeronautica in Italy; and the fuselage sections by Vought in Charleston, South Carolina (USA), Alenia in Italy, Kawasaki Heavy Industries in Japan and Spirit AeroSystems, in Wichita, Kansas (USA). The passenger doors are made by Latecoere (France) and the cargo doors, access doors and crew escape door are made by Saab (Sweden). Honeywell and Rockwell-Collins provide flight control, guidance and other avionics systems, including standard dual head up guidance systems. Boeing assembles the 787s in Everett, Washington, employing 800 to 1,200 people to join completed subassemblies and integrate systems and so the final assembly time is reduced to only three days. This is less than a fourth of the time traditionally needed for Boeing's final assembly process.

Takeoff Delays

Boeing originally planned for a first flight on August 27, but on August 10, 2007 Boeing spokeswoman Yvonne Leach said that the date might slip, citing factors including final assembly, avionics integration, and completion of software, hydraulic, electronic and other systems. On September 5, 2007 Boeing announced a three month delay to the first flight, citing a shortage of fasteners and rivets as well as incomplete software. A further three month delay to the first flight was announced on October 10, 2007; which was now scheduled for the end of the first quarter of 2008. Boeing also said that the first 787 deliveries would be delayed by six months from May to December 2008. The Company cited problems with its foreign and domestic supply chain in explaining the delay, especially the ongoing fastener shortage, the lack of documentation from overseas suppliers, and continuing delays in the flight guidance software provided by Honeywell. The resulting delays have affected 19 of the 52 airlines that have ordered the 787, some of which were counting on using their planes during the 2008 Summer Olympics. Boeing could end up paying millions in penalty payments to customers.

The Wall Street Journal reported that Boeing 787 Dreamliner is being delayed due to its global value chain. Instead of using their own engineers to do the design work Boeing outsourced that work to even smaller companies. And in their eagerness to profit from the 787 windfall, overloaded themselves with work from multiple 787 suppliers. Lack of strict enough performance goals for its suppliers resulted in the first airplane arriving at the factory in 30,000 pieces instead of the scheduled 1,200 for the final-assembly process. Industry analysts opine that for the Dreamliner program, Boeing functions less as a manufacturer than as a project manager, supervising its first- and second-tier subcontractors, each of which may rely on scores of more specialized subcontractors. Though Boeing has not disclosed the full list of subcontractors that are working on the project, industry analysts estimate that their numbers are greater than the 900-plus that contributed to the 777, which began construction in 1990. But the processes used to construct the two planes are markedly different, confirms Boeing spokesperson, Loretta Gunter, "We have fewer first-tier subcontractors on the 787 than we did on the 777 because each is providing bigger components. Likewise, many of them are contracting out bigger jobs to their subs." "Boeing's objective is to get these 'supplier partners' to do as much heavy lifting as possible," says Richard Aboulafia, vice president at Teal Group, an aerospace consulting firm. "That gives small businesses more responsibility."

Is Boeing too optimistic?

In the meantime, Boeing executives tapped Pat Shanahan (Shanahan) as the CEO, to fix the production problems. Shanahan had been Boeing's über-program manager, and best known for

turning around two messy, complicated, and controversial defense programs—helicopters and management of missile defense systems. He said the bulk of his time since taking over two months ago has been spent figuring out how to resolve the large amount of uncompleted work, called "travelers", and the lack of a logical process to handle and resolve the problem. The management set a threefold focus: complete the first aircraft and get it in the air; work with suppliers to smooth the way for production rate increases; and make sure the entire production system is ready to handle the rapid boost to production rates in 2009. Shanahan reorganized the 787 division into three departments: development, supplier management, and final assembly and operations. "We have broken down the activity into logical work packages," says Shanahan. "Teams were previously trying to brute-force through some of these problems," he said. "Now, we have a clear plan. We've mapped every open hole to every fastener. I can tell you where every one is. It's more about putting those disciplines in place. Previously, maybe it wasn't expected." At the same time, he's spent a lot of effort making sure that suppliers—even second- and third-tier ones—are ready to boost production to support the delivery of 109 aircraft. He directed Boeing auditing teams to independently verify that the suppliers can meet their production targets and determine where they need help.

Shanahan admits the 787 schedule remains "aggressive" and that he's committed to meeting it. The Honeywell flight-control software is under control, the flight-control tests will occur after power-on and the first flight is scheduled for the January-February time frame. Scott Carson, president and CEO of Boeing Commercial Airplanes said, "The most important commitment we've made to our customers is to deliver an airplane that performs to their expectations over the long life of the program. These changes to our schedule will help ensure we do just that." The efforts seem good for the customers, but without a plan of action to boost production in the long-term, investors are keeping Boeing 787 on the radar.

Discussion Questions

1. What is the strategic implication of the 787 program for Boeing?
2. Why do you think they are in the current situation?
3. Comment on the steps taken by Shanahan to turn around the project.
4. If you were Shanahan, what will be your plan of action?

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